

The Butterflies and Skippers of the North-Aegean Islands of Híos, Psará and Lésvos (Greece). New observations and an update on their distribution (Papilionoidea & Hesperioidea)

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Abstract. Recent fieldwork by different entomologists and research on the internet clearly indicate the need for an update concerning the butterfly and skipper species of the North-Aegean Islands of Híos, Lésvos and Psará. The data provided in this study, include species new for these islands as well as confirmation of some poorly documented species. *Pelopidas thrax* (Hübner, 1821) is recorded for the first time from Híos and confirmed for Lésvos. During this survey, 6 new species were recorded for Psará. *Cupido osiris* (Meigen, 1829) is reported as new to Híos and *Issoria lathonia* (Linnaeus, 1758) needs confirmation for the same island. For the first time, *Lycaena thersamon* (Esper, 1784) and *Brenthis daphne* (Bergsträsser, 1780) are being recorded here for Lésvos. An update is provided concerning *Gegenes* and the distribution of the *Maniola* taxa is discussed. Finally, an overview of the distribution of the butterfly and skipper species of these North-Aegean Islands is provided.

Samenvatting. De Dagvlinders en Dikkopjes van de Noord-Egeïsche eilanden Híos, Psará en Lésvos (Griekenland). Nieuwe observaties en een overzicht betreffende hun verspreiding (Papilionoidea & Hesperioidea)

Recent veldwerk van meerdere entomologen en onderzoek op het internet tonen duidelijk de nood aan voor een update over de soorten dagvlinders in de Noord-Egeïsche eilanden Híos, Lésvos en Psará. In deze studie worden gegevens opgenomen over soorten die nieuw zijn voor deze eilanden alsook bevestiging gegeven van sommige, slecht gedocumenteerde soorten. *Pelopidas thrax* (Hübner, 1821) wordt voor het eerst gemeld van Híos en bevestigd voor Lésvos. Gedurende dit onderzoek werden voor Psará 6 nieuwe soorten opgetekend. *Cupido osiris* (Meigen, 1829) is nieuw voor Híos en *Issoria lathonia* (Linnaeus, 1758) moet er bevestigd worden. Voor het eerst, worden *Lycaena thersamon* (Esper, 1784) en *Brenthis daphne* (Bergsträsser, 1780) hier vermeld in de literatuur voor Lésvos. Betreffende *Gegenes* wordt een actualisatie gegeven en de verspreiding van de soorten *Maniola* wordt besproken. Ten slotte wordt een synthese over de verspreiding van de dagvlinders van deze Noord-Egeïsche eilanden voorzien.

Résumé. Les Papillons de jour et les Hespérides des îles égéennes du Nord, Híos, Psará et Lésvos (Grèce). Nouvelles observations et mise à jour de leur distribution (Papilionoidea & Hesperioidea)

Des travaux récents sur le terrain par plusieurs entomologistes et une recherche sur internet montrent clairement la nécessité d'une mise à jour concernant la distribution des papillons dans les îles égéennes du Nord, Híos, Psará et Lésvos. Dans cette étude, des données sont fournies incluant des espèces nouvelles pour ces îles ainsi que la confirmation pour certaines espèces qui n'étaient pas bien documentées. *Pelopidas thrax* (Hübner, 1821) est mentionné pour la première fois de Híos et est confirmé pour Lésvos. Au cours des recherches 6 espèces nouvelles pour Psará ont été relevées. *Cupido osiris* (Meigen, 1829) est nouveau pour Híos et *Issoria lathonia* (Linnaeus, 1758) devra y être confirmé. Pour la première fois dans la littérature, *Lycaena thersamon* (Esper, 1784) et *Brenthis daphne* (Bergsträsser, 1780) sont mentionnés avec certitude de Lésvos. Une mise à jour est effectuée à propos des *Gegenes* et la distribution des différentes espèces de *Maniola* est commentée. Enfin, une synthèse de la distribution des papillons de ces îles égéennes du Nord est établie.

Key words: Greece – North-Aegean Islands – Híos – Psará – Lésvos – Rhopalocera – Papilionoidea – Hesperioidea – *Thymelicus acteon* – *Gegenes pumilio* – *Gegenes nostradamus* – *Pelopidas thrax* – *Pieris krueperi* – *Pontia edusa* – *Colias croceus* – *Lycaena thersamon* – *Lampides boeticus* – *Cupido osiris* – *Pseudophilotes vicrama* – *Charaxes jasius* – *Vanessa atalanta* – *Issoria lathonia* – *Brenthis daphne* – *Maniola jurtina* – *Maniola megalis* – distribution – faunistics.

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Introduction

Lésvos and Híos (with the adjacent small islands Inússes, Psará and Antípsara) are two of the largest, set apart North-Aegean Islands (Fig. 1). South of Híos there are two other Greek islands: Sámos and Ikaría. Situated north of Lésvos are the Greek islands of Thássos, Límnos and Samothráki plus the Turkish ones of Imbros, Tenedos and Tavşan Islands.

Lésvos is the third largest Greek island (1632 km²) and on its NE side its least distance from Turkey is only 5.5 km. Two unequal gulfs with very narrow openings to the Aegean Sea, the gulfs of Kalloní and Yéra, divide the island into three parts and are considered as being a local expression of a regional extension (Soulakellis et al. 2006). The northern part of the island is dominated by Óros Lepétimnos (968 m) and its western part by Profítis

Ilías (799 m), both of volcanic origin. The southeastern part consists of ophiolites, crystalline limestone and metamorphic rock and is dominated by Óros Ólimbos (967 m). Neocene and quaternary sediments are present in the gulfs and plains formed by the main river valleys.

Fifty kilometers south of Lésvos lies the island of Híos, the fifth largest of the Greek islands (842 km²), which is located to the west of and at a least distance of only 7 km from the Karaburun peninsula on the Turkish mainland. A ridge of mountains runs the length of the island. Óros Pellinéon (1297 m), the highest peak, is situated in the northern part of the island. The southwestern to the northeastern part of Híos consists of limestone and dolomites. Óros Amaní (806 m) rises on the northwestern edge of the island and is composed mainly of clastic rock. The lower, southeastern part of the island consists of fluvial-lacustrine deposits. Inússes,

a cluster (18 km²) of one larger and some surrounding smaller islands, is located between the northeast coast of Híos and Turkey.

The small island of Psará (44 km²) is located ca. 19 km west of Híos. The southwestern part is low. The highest point, Ághios Ilías (531 m), is situated in the northern part of the island. Metasedimentary rock systems are predominant in Psará. For a long time they were of unknown stratigraphic age and uncertain affiliation: “Mountrakis *et al.* (1983) correlated both units of Psará with the Subpelagonian Zone of continental Greece,

whereas Wallbrecher (cited by Dürr & Jacobshagen 1986) favoured an affiliation to successions from the southern Pílion peninsula and the northern Sporades of the Pelagonian Zone”.

Recent research now indicates that Híos and its surrounding islands of Inússes and Psará most probably represent a link between Pelagonian units in Greece and Sakarya–Anatolide–Tauride units in Turkey (Meinhold *et al.* 2007). It might well be that the distribution of the different species of the genus *Maniola*, in these islands, is also a reflection of the formation history of the islands.

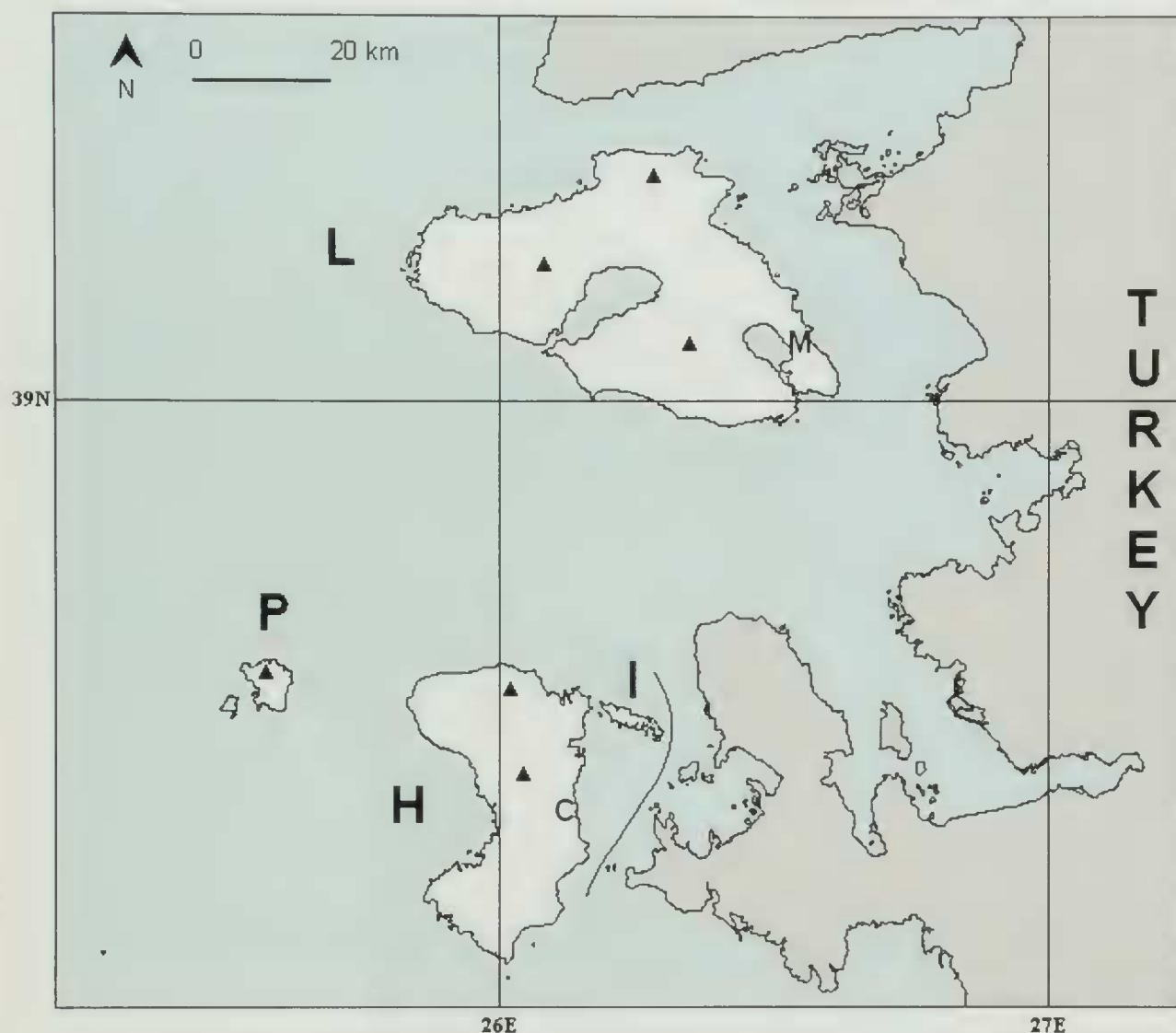


Fig. 1 – Map of the North-Aegean islands Lésvos, Híos and Psará and adjacent parts of Turkey.

Legend: C: Híos town; H: Híos; I: Inússes; L: Lésvos; M: Mitilíni; P: Psará; peaks: ▲.

Most reviews about the butterfly fauna of these islands were published more than ten years ago (Olivier 1993, Dennis *et al.* 2000, 2001a, 2001b). Recently, Pamperis (2009) published distribution maps of all butterfly species of Greece, based on a compilation of data from his personal observations (red dots) and from a literature study including also data from extensive searches on the internet (blue dots). Internet sources come and go and are difficult to control, making the interpretation of all blue dots difficult. Dennis (2001a & 2001b) already emphasized the need for recorders to take voucher specimens of species considered to be new records for islands and this was recently repeated (Cuvelier & Mølgaard 2012, Coutsis & Ghavalas 2013). Without voucher specimens, it is more difficult for biogeographical research to accept the observations as valid records or as adequate data for conservation purposes, even for conspicuous organisms. The recent maps in Pamperis (2009) also include question marks without giving specific comments about it. The interpretation of such data becomes very complex and

hazardous. The Distribution Atlas of Butterflies in Europe (Kudrna *et al.* 2011) proved useless for these islands as the resolution of the data is at a much larger scale, a fact admitted by one of the authors.

Recent surveys of other Greek islands have provided quite some new data but at the same time have also shown that the butterfly fauna of such areas has not yet been sufficiently studied (Cuvelier 2009, Cuvelier & Mølgaard 2012, Coutsis & Ghavalas 2013). For the island of Psará, only five butterfly species have been mentioned in literature. Even when taking into account that the vegetation of this island consists mostly of short shrubs, this seems too low a number, indicating the need for new surveys in these North-Aegean Islands as well. Renewed investigations on the actual distribution of the butterflies are mandatory in order to monitor and protect important taxa and their habitats. Changes in the butterfly fauna since the Neolithic already must have had a major impact on the occurrence of some species and modern human activities add new threats that might further decrease biodiversity. Global warming as well

might yield rapid changes in the occurrence of taxa at the limit of their distribution but this needs to be interpreted with caution (Kudrna 2013).

Methods

During a field trip from 26th of May to 9th of June 2012 the author (SC) surveyed many localities on the three islands under consideration. Details are given in Appendix 2: Híos (Table 1), Psará (Table 2) and Lésvos (Table 3). Mike Taylor (MT) for Híos and Mike Hull (MH) for Lésvos provided many important and unpublished personal field observations that were made over many years of endeavour. The material from their research (not only Papilionoidea & Hesperioidea) is deposited in the Zoology collection of the World Museum at Liverpool (WML) and is one of the major sources for this analysis. Further data, included in this update, come from unpublished field observations by Peter Russell (PR), Diederik Van den Abbeele (DV), Daniël De Backer (DD) and partly published observations by Morten S. Mølgaard (MM) (Mølgaard 2013).

Despite the difficulty of asserting the validity of the data, the internet remains a potential source of information. And indeed quite some observations, sometimes including photographs, became available during recent years. This gave the impression that many

species, new for some of these islands, had been found. But for the goal of this survey, the value of these sources often proved questionable and included doubtful records generating suspicion of invalidity about the total information of some websites. In the actual analysis, only three websites have been included. The first one (van Leeuwen 2011, URL1) provides a list of butterflies for Lésvos and as such it can be an important source for people researching the subject. The author has answered to all questions posed by the present author in a transparent way, but only the observations supported with photographs, sent on request, are included in this analysis. The two other retained URLs have photographs allowing certainty of determination of interesting taxa and mentioning sufficient details about the observations: Don (2010, URL2) and Schoenmakers (2012, URL3). For the latter two it was impossible to get in touch with the authors. All other internet sources have been ignored in this analysis because they lack the potential to validate the observations and especially the identifications for species belonging to genera with morphologically very similar species.

The nomenclature applied in this work for all included taxa follows the one used in Fauna Europaea (Vliegthart *et al.* 2013) (URL4).



Fig. 2a – Habitat of *Thymelicus acteon* on Psará, Zoodhóhos Piyí, 46 m, 30.v.2012 (Photo: SC).

Fig. 2b – *Thymelicus acteon* ♂, Psará, Zoodhóhos Piyí, 46 m, 30.v.2012 (Photo: SC).

Fig. 2c – *Thymelicus acteon* ♀, Psará, Zoodhóhos Piyí, 46 m, 30.v.2012 (Photo: SC).

New data

Thymelicus acteon (Rottemburg, 1775). New to Psará.

A single but strong population was found in a small valley (Fig. 2a) near Zoodhóhos Piyí (46 m) on the northwestern side of Psará. Males and females (Fig. 2b & 2c) were fresh on 30.v.2012. Voucher specimens are in the reference collection of SC. In a model (Dennis *et al.* 2001a), based on a single short survey (Olivier 1993) on this island, *T. acteon* was not predicted for Psará. However, its occurrence is not completely unexpected as the species is known from the nearby island of Híos and has also been confirmed from many other Aegean islands.

Gegenes pumilio (Hoffmannsegg, 1804). Confirmed for Híos.

In two reviews (Dennis *et al.* 2000, 2001a), *G. pumilio* was not documented and also not predicted for Lésvos, Híos and Psará. However, it was soon added by the same author (Dennis *et al.* 2001b), on the basis of annual observations, since 1996, carried out during biodiversity research by the Liverpool Museum undertaken by MT. In the distribution map (Pamperis 2009) of *G. pumilio* there are no additional personal observations from the author for these islands and only a single blue dot is given for the northern part of Híos (Pamperis 2009). Voucher specimens (Coll. MT & MH) from Kambiá Beach (08.v.2000) and Thimianá (15.v.2001, 4–15.x.2002) are preserved in the WML and a photograph of the male genitalia from one of these voucher specimens is included (Fig 3). There is no evidence, known to the author, that *G. pumilio* has been observed on the nearby island of Psará or in Lésvos and its occurrence for these two islands was not predicted (Dennis *et al.* 2001a).



Fig. 3 – Male genitalia of *Gegenes pumilio*, Híos, Thimianá, 4.x.2002 (leg. M. J. Taylor). Genitalia preparation 4205, M. Hull.

Gegenes nostradamus (Fabricius, 1793). Confirmed for Lésvos and Híos.

G. nostradamus was not mentioned from Lésvos (Dennis *et al.* 2000, 2001a, 2001b) till the publication of the distribution map for this species (Pamperis 2009). This map does not mention a personal observation from the author but shows two blue dots in the Gulf of Kalloní that are based (oral comm.) on information given by MH. Voucher specimens from Skála Kallonís collected

between 19–24.ix.2008 are indeed preserved in the WML. *G. nostradamus* is also confirmed for Híos at Káto Faná on 27.ix.2002 by a voucher specimen in the WML and a photograph of the male genitalia is included (Fig 4). *G. nostradamus* was also regularly seen in October 2011 in an apartment garden in Vrondádhos (MT). There is no prediction (Dennis *et al.* 2001a) and there are at present no observations known to the author from the island of Psará.



Fig. 4 – Male genitalia of *Gegenes nostradamus*, Híos, Káto Faná, 27.ix.2002 (leg. M. J. Taylor). Genitalia preparation 4206, M. Hull.

Pelopidas thrax (Hübner, 1821). New to Híos and confirmed for Lésvos.

In Greece, *P. thrax* was already known from three Dodecanese islands (Ródhos, Kastellórizo and Kos) and from Sámos (Cuvelier 2009). Recently, the species has

also been documented from Kalímnos, another Dodecanese island (Martin & Russell 2013). Along the Turkish coast the species is mentioned nearby Sámos but not nearby Híos and Lésvos. There is however one dot in the distribution map of *P. thrax*, much more north along

the Sea of Marmara (Hesselbarth *et al.* 1995). MT's earliest observation, in Híos, goes already back to the year 2002 and mentioned: "we just take a voucher specimen if something previously unrecorded turns up, as was the case when I came across several of the *P. thrax* flying in the abandoned coastal claypits in Thimianá on 8th October 2002." This female voucher specimen is figured here (Fig. 5a). The observation of several specimen leaves the impression that this is not a recent spread to the island of Híos and brings evidence that *P. thrax* is present since quite some years in the North-Aegean islands and is not due to a recent expansion as

suggested (Martin & Russell 2013). Other observations, cited by MT (oral comm.), support that the butterfly is a true resident of this island: "I found a male *Pelopidas thrax*, specimen number A14923, taken at Káto Faná in south Híos on the 23rd September 2009. I distinctly recall the event, there were large numbers of this species on the wing more than 50 perhaps more than 100. As it looked rather larger than the common Hesperids I took one voucher specimen which I only really looked at properly today." One male voucher specimen is figured (Fig. 5b).



Fig. 5a – *Pelopidas thrax* ♀, upper- and underside, Híos, Thimianá claypits, 10 m, 8.x.2002 (Coll. & Photo: MT).

Fig. 5b – *Pelopidas thrax* ♂, upper- and underside, Híos, Káto Faná, 5 m, 23.ix.2009 (Coll. & Photo: MT).

Fig. 5c – *Pelopidas thrax* ♂, Híos, Vrondádhos, 5 m, 7.x.2011 (Photo: MT).

Fig. 5d – Habitat of *Pelopidas thrax*, Híos, Keramía, 25 m, 28.v.2012 (Photo: SC).

Also at Vrondádhos, north of Híos town, MT photographed a male *P. thrax* (Fig. 5c). Like in the Dodecanese islands, it seems that also on Híos the spring generation is rare. A single fresh male was collected by SC at Keramía on 28.v.2012 in a typical wet waste ground with reed vegetation (Fig. 5d). Despite a lengthy search in this area no other specimens were seen. The voucher specimen is in the reference collection of SC. The actual situation with *P. thrax* in Lésvos is less clear. S. van Leeuwen (URL1) was the first to mention the presence of this species but she was unable to provide any evidence

(Cuvelier 2009). The distribution map of *P. thrax* (Pamperis 2009) shows only a blue dot along the Gulf of Kallóni. It is based on a photograph in a personal communication with a foreign entomologist. At least two URL have shown good photographs since then. The first certain observation from 28.ix.2010, known to the author, comes from H. Don (URL2) showing a fresh specimen feeding on a yellow flower in the coastal town of Síghri. B. Schoenmakers photographed a worn specimen basking on a stone at Skála Kallonís on 11.x.2012 (URL3). With the present knowledge it looks

difficult to comment on the status (migrating specimens or resident) of *P. thrax* in Lésvos but there is good evidence that it can be found in this island. *P. thrax* is not predicted (Dennis *et al.* 2001a) for Lésvos or Psará. There are at present no observations known to the author from the island of Psará.

Pieris krueperi (Staudinger, 1860). Confirmed for Híos and Lésvos.

P. krueperi was not known or predicted for Lésvos (Dennis *et al.* 2001a). This species was first mentioned in the website of Sylvia van Leeuwen (URL1) from 2005, on Óros Ólimbos. This information (oral comm. by Pamperis) is included as a blue dot in the map of this taxon (Pamperis 2009) but neither a voucher specimen nor a photograph is available (van Leeuwen, oral comm.). Voucher specimens were however already collected before 2005. Strong evidence is provided here: at Áryenos DD collected *P. krueperi* on 11.v.1999 and a voucher specimen is preserved in his reference collection. On 24.v.2002, DV also observed *P. krueperi* south of Áryenos by DV on and he collected voucher specimens as well. For Híos, the presence of *P. krueperi* has already been documented (Dennis *et al.* 2000, Tolman 1997) but only blue dots (no personal observations from the author) are given by Pamperis (2009). One worn specimen was collected by SC, north of Vrondádhos, on 31.v.2012 and is preserved in his reference collection.

Pontia edusa (Fabricius, 1777). New to Psará.

Single specimens were observed on 30.v.2012 by SC at Ahladhókambos (16 m) where one fresh male was collected and east of Nerovíghlia (12 m). This voucher specimen is in the reference collection of SC. There was >75% probability that *P. edusa* could occur on this island (Dennis *et al.* 2001a).

Colias croceus (Fourcroy, 1785). New to Psará.

C. croceus was observed on 30.v.2012 at different localities in the northern part of the island: at Zoodhóhos Piyí (46 m), in a valley southwest of Ághios Ilías (233 m), at the foot of Ághios Ilías (254 m) where a worn male voucher specimen was collected, at the Kímissi tis Theotóku Monastery (336 m) where a fresh female of the f. *helice* was collected and north of Ághios Ilías (352 m). The two voucher specimens are in the reference collection of SC. There was >90% probability that *C. croceus* could occur on this island (Dennis *et al.* 2001a).

Lycaena thersamon (Esper, 1784). New to Lésvos.

No publication provides evidence for the presence of *L. thersamon* in these islands. A question mark is present in the distribution map by Pamperis (2009). MH collected a fresh male (Fig. 6) at Skála Kallonís (39°12'22"N 26°13'3"E), Lésvos, on 21.ix.2002. The specimen is still in his private collection, though in due course it will be placed in the WML. Photographs were kindly taken and provided by MT. This male is the only known proof of the presence of this species on Lésvos. The occurrence of *L. thersamon* was not predicted for these three islands (Dennis *et al.* 2001a).



Fig. 6 – *Lycaena thersamon* ♂, upper- and underside, Lésvos, Skála Kallonís, 21.ix.2002 (Coll. MH).

Lampides boeticus (Linnaeus, 1767). New to Psará.

SC collected a single male specimen south west of Áyii Apóstoli (141 m) on 30.v.2012. No other specimens were observed. The voucher specimen is in the reference collection of SC. There was >50% probability that *L. boeticus* could occur on this island (Dennis *et al.* 2001a).

Cupido osiris (Meigen, 1829). New to Híos.

The species was unknown from and unpredicted for these three islands. In the Aegean, *C. osiris* has only been confirmed from the island of Límnos (Olivier 1988) and a

blue dot is also present for this island in the distribution map by Pamperis (2009). This species seems extremely rare in the Aegean Islands. The distribution map of *C. osiris* (Pamperis 2009) also shows a question mark for Lésvos. *C. osiris* is not included in the updated overview for Lésvos (Appendix 2) as it was not possible to verify the sources. MT collected a worn male (Fig. 7) at Ghrídhia, Híos, on 3.v.2000. The voucher specimen is preserved in the WML. This is the first evidence of the occurrence of this butterfly in Híos.



Fig. 7 – *Cupida asiris* ♂, upper- and underside, Híos, Ghrídhia, 3.v.2000 (Coll. MT).

Pseudophilotes vicrama (Moore, 1865). New to Psará.

A single female voucher specimen (Fig. 8b) was collected south west of Áyii Apóstoli (Fig. 8a) on

30.v.2012 and is preserved in the reference collection of SC. There was >50% probability that *P. vicrama* could occur on this island (Dennis et al. 2001a).



Fig. 8a – Habitat of *Pseudophilotes vicrama*, Psará, SW Aghii Apostoli, 30.v.2012 (Photo: SC).

Fig. 8b – *Pseudophilotes vicrama* ♀, Psará, SW Aghii Apostoli, 30.v.2012 (Coll. SC).

Charaxes jasius (Linnaeus, 1767). Needing confirmation for Lésvos.

There is good evidence for *C. jasius* from Híos and a voucher specimen collected on 12.vi.1997 at Káto Faná is preserved in the WML. For Lésvos, good evidence is lacking despite the fact that it is such a conspicuous butterfly. A recent indication of its occurrence was given by MM who observed *C. jasius* in the company of T. Kristensen on 7.vi.2013 at Megháli Límní and 7 km north of Kalloní but they were unable to photograph or collect a voucher specimen. There is >50% probability that *C. jasius* could occur on this island (Dennis et al. 2001a). There is no prediction for Psará and it is unlikely that this species will ever be found in this island as there is no suitable habitat for it.

Vanessa atalanta (Linnaeus, 1758). New to Psará.

A small, fresh voucher specimen was collected on 30.v.2012 at Nerovíghlia (14 m). *V. atalanta* was also observed at the Kímissi tis Theotóku Monastery (336 m) and south west of Áyii Apóstoli (141 m) on 30.v.2012. The voucher specimen is in the reference collection of SC. There was >90% probability that *V. atalanta* could occur on this island (Dennis et al. 2001a).

Issoria lathonia (Linnaeus, 1758). To be confirmed for Híos; confirmed for Lésvos.

For a long time there was no evidence that *I. lathonia* occurs on the three islands (Dennis et al. 2000) and the model for predicting the occurrence estimated >50 % chance but carefully mentioning: “unreliable, based on N

≤ 4 and/or of marginal significance” (Dennis et al. 2001a). Pamperis (oral comm.) observed the species near Aghiásson, on 24.vi.1994 from 400 to 600 m and this is already mentioned in his first book (Pamperis 1997). This observation is also marked as a red dot in the distribution map (Pamperis 2009). This locality was confirmed by PR observing the species at ± 675 m on 31.v.2008 and 5.vi.2008 (Russell 2009). On 6.vi.2012, SC also observed and photographed different specimens at altitudes above 700 m on Óros Lepétimnos on the northern side of Lésvos. In the observation list of MT, *I. lathonia* is not mentioned from Híos and also in the distribution map not a single dot is present (Pamperis 2009). Recently, on 2.v.2011, PR observed *I. lathonia* at Pirghí and at Kipuríes on 6.v.2012 but he did not collect a voucher specimen. Confirmation is needed. It is unlikely that *I. lathonia* will ever be found in the island of Psará, as there is no suitable habitat for it.

Brenthis daphne (Bergsträsser, 1780). New to Lésvos.

In the Aegean islands *B. daphne* was known only from Sámos (Dennis et al. 2000, 2001a) and no predictions could be made based on its occurrence in a single island. The distribution map for *B. daphne* (Pamperis 2009) is confirming this and only adds a personal observation from the same island. The species also seems rare in western Turkey (Hesselbarth et al. 1995). Knowing of no publications mentioning this species from Lésvos, the author was surprised to observe a single *B. daphne* feeding, high in a chestnut tree, on 6.vi.2012 near Lepétimnos (383 m). On 7.vi.2012 the species was again

found, in small numbers from Aghía Anna to Kríta and on a dust road towards Eftalú (294 m). The same day, west of Áryenos (372 m) the species was feeding on *Rubus* sp. and very common. On 8.vi.2012, near Fília (358 m), *B. daphne* was again common. Voucher specimens are in the reference collection of SC and males and females were photographed (Fig 9a-d). During the trip, SC met MH at Skála Kallonís and this observation was discussed. MH asked for a collected specimen for the WML as this looked new for the island and a single specimen was

kindly given. Mentioning this, months later, to MT it became clear that these observations were not the first observation of *B. daphne* from Lésvos: "When you met him in Skála Kallonís he told you that he had not taken/seen *Brenthis daphne* on Lésvos, however he had forgotten one specimen which he took 12th June 1989 at Skalahóri." Also PR informed me later having observed *B. daphne* in two localities near Fília on 30.v.2012. There is no suitable habitat for this species in Psará and it is unlikely that this species will be found in this island.

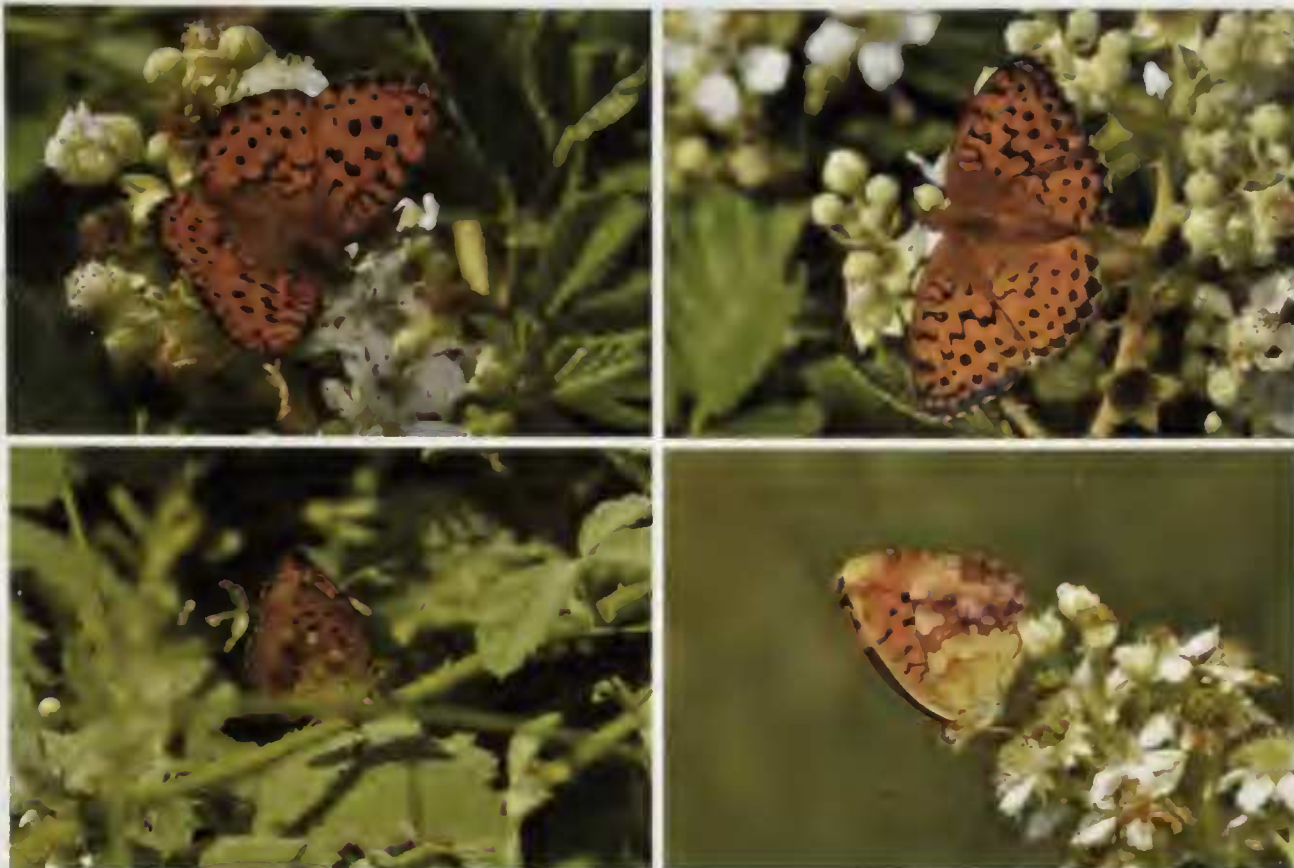


Fig. 9a – *Brenthis daphne* ♂, Lésvos, W Áryenos, 7.vi.2012 (Photo: SC).

Fig. 9b – *Brenthis daphne* ♀, Lésvos, W Áryenos, 7.vi.2012 (Photo: SC).

Fig. 9c – *Brenthis daphne* ♂, Lésvos, Aghía Anna to Kríta, 7.vi.2012 (Photo: SC).

Fig. 9d – *Brenthis daphne* ♀, Lésvos, Aghía Anna to Kríta, 7.vi.2012 (Photo: SC).

Notes

Thymelicus lineola (Ochsenheimer, 1808).

Sylvia van Leeuwen (URL1) mentions the observation of this species in 2005, halfway between Aghiásson to Assómatos. However, she could not provide a photograph or a voucher specimen and seemed uncertain about the identification. For this specific reason, SC collected all *Thymelicus* specimens met with in the field, and prior to releasing them had the tip of the antennae checked for identification purposes. Not a single specimen turned out to be *T. lineola*. Already in a previous article (Cuvelier & Mølgaard 2012) a question mark was given concerning the occurrence of this species on the eastern Aegean islands. The question mark can be deleted in the light of the above observations as this was the only doubtful record at that time. This question mark was later further supported by the presence of an alleged *T. lineola* in the WML. As, however this specimen finally proved to be a *Thymelicus sylvestris* (Poda, 1761), the question mark can now be deleted. It now appears certain that *T. lineola* is absent from Lésvos and therefore the species is not included in the table (Appendix 1).

Pieris mannii (Mayer, 1851).

P. mannii was reported once from Híos (Gaskin & Litter 1988). As its identification at times is problematic by wing characters and always impossible by genitalia, the record cannot be accepted with certainty. The said specimen was within all probability a *Pieris rapae* (Linnaeus, 1758) with exceptionally heavy black markings at the apex of the forewing upper side. This is not that uncommon in autumn. Pending its confirmation on the basis of further captures, the species is presently not included in the table (Appendix 1).

The genus *Maniola* (Schrank, 1801).

The distribution of the *Maniola* species in the Aegean islands is a complex puzzle and their status is still under study (Grill *et al.* unpublished data). Four *Maniola* species have been documented from these three islands but it is only in Lésvos that two species, *Maniola telmessia* (Zeller, 1847) and *Maniola megala* (Oberthür, 1909), are found on the same island and are partly synchronous and syntopic in a few localities. A new species of the genus, *Maniola chia* (Thomson, 1987), was described from Híos based on external morphology, genitalia, egg morphology, larval chaetotaxy and enzyme electrophoresis. This taxon is also present on the nearby island cluster of Inússes, east of Híos. Doubts remain on its status and some authors treat this taxon as a

subspecies of *M. jurtina* (Tshikolovets 2011). From Psará, the nearby island west of Híos, *Maniola jurtina janira* (Linnaeus, 1758) was mentioned for the first time by Olivier (1993): “On Psará, the very first males of *M. jurtina* (!) were just emerging on 19.V.” On p. 175 of the book, where this observation is mentioned, neither photograph nor genitalia are included. This observation is in contrast with the presence of *M. chia* on the nearby island Híos. This might shed some light on the unresolved question of the stratigraphic age and affiliation of the island.

Both units of Psará have been linked to the Subpelagionian Zone of continental Greece and this might explain the presence of *M. jurtina* in Psará and of another taxon on Híos and Inússes. Other sources favour an affiliation to successions from the southern Pílion peninsula and the northern Sporádhés (Meinhold 2007) of the Pelagionian Zone and the presence of *M. jurtina* only on the island of Psará becomes less clear cut but not impossible in this hypothesis. The most recent research indicates a link between Pelagionian units in Greece and the Sakarya-Anatolide-Tauride units in Turkey but asks as well for a reinvestigation of the (meta)sedimentary successions in the eastern Aegean Sea (Meinhold 2007). Again it offers potential to explain the distribution of *M. jurtina* but for the moment these assumptions are hypothetical. Different question marks are given in the distribution map of *M. jurtina* (Pamperis 2009) concerning the islands of Lésvos and Ikaría making the interpretation even more difficult. For Lésvos all data

used in the map (information kindly provided by Pamperis) come from doubtful sources (opinion SC). There is no evidence at all for the presence of *M. jurtina* in Lésvos and it is not included in the table (Appendix 1). In order to better document the situation, first for Psará, SC anticipated that the determination given by Olivier (1993) might have been based on a genitalia study by Coutsis, who indeed kindly supplied the documents (Fig. 10) that show the male genitalia of an undoubted *M. jurtina* from “eastern” populations. On 30.v.2012, *M. jurtina* was found by SC in many biotopes (Fig. 11a) from lowland at Ahladhókambos to an altitude of 356 m near the Kímissi tis Theotóku Monastery. Most males (Fig. 11b) were no longer fresh but females (Fig. 11c) had only recently emerged and a number of couples were observed in copula (Fig. 11d). For comparison purposes a photograph is also included of a couple of copulating *M. telmessia* from Lésvos (Fig. 12).

To make the picture more complete, herewith are mentioned some other North-Aegean islands from where the presence of *M. jurtina* is supported by the study of genitalia: Límnos (130 km north of Híos & Psará) confirmation by genitalia from Coutsis (oral comm.), Skíros (76 km west of Psará) the southernmost island of the Sporádhés archipelago from where Coutsis described the occurrence of *M. jurtina* without documenting the male genitalia (Coutsis 1976) but he confirmed to SC that it was done (oral comm.), Ándhros island (87 km SW of Psará) the northernmost island of the Kikládhes archipelago (Coutsis 1985) and confirmed by genitalia.

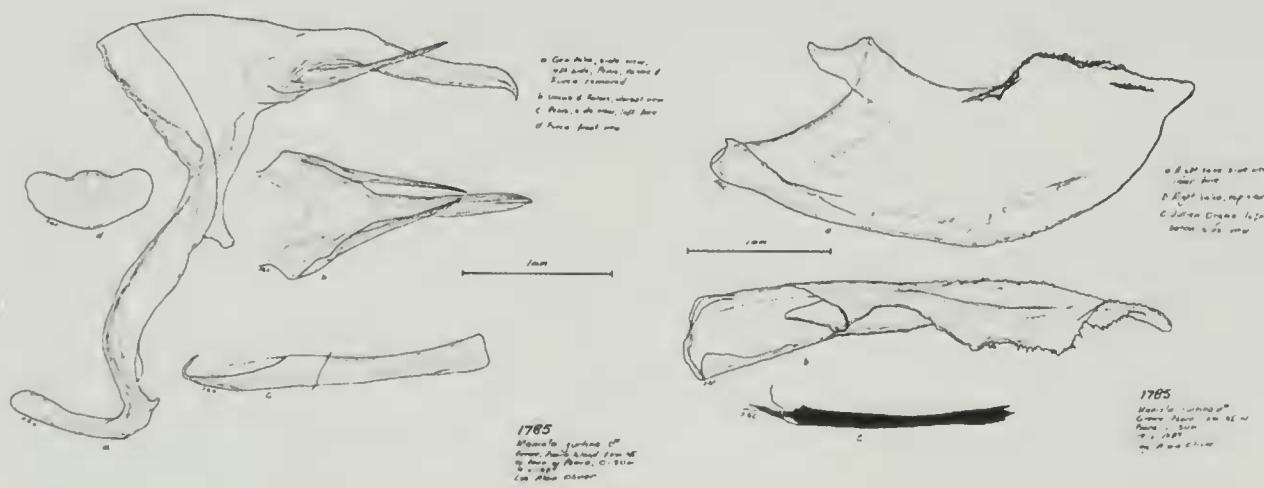


Fig. 10 – Male genitalia of *Maniola jurtina*, island of Psará, 1 km NE of town of Psará, (leg. A. Olivier). Genitalia preparation 1785 and drawing J. G. Coutsis.

SC sampled the different *Maniola* taxa in the three islands for the ongoing study of Grill and two specimens from Psará were included in the mitochondrial DNA analysis: “we sequenced two of your specimen from Psará for the mitochondrial COI region. They cluster within the *Maniola chia* and other *Maniola jurtina*

samples.” This seems to imply also that there is no genetic evidence separating these *Maniola* species that are now used in taxonomy. It would be very interesting to perform hybridization experiments between the different *Maniola* species to elucidate the puzzle.



Fig. 11a – Habitat of *Maniola jurtina*, Psará, valley S.W. of Profitis Ilías, 30.v.2012 (Photo: SC).

Fig. 11b – *Maniola jurtina* ♂, Psará, Valley SW of Profitis Ilías, 30.v.2012 (Photo: SC).

Fig. 11c – *Maniola jurtina* ♀, Psará, Ahladhókambos, 30.v.2012 (Photo: SC).

Fig. 11d – *Maniola jurtina* copula, Psará, Ahladhókambos, 30.v.2012 (Photo: SC).

Fig. 12 – *Maniola telmessia* copula, Lésvos, Ághra, 4.vi.2012 (Photo: SC).

Very interesting is also the presence of *M. megala* on Lésvos, the only place in Europe where this species has been found. It was first mentioned as a footnote by Olivier (1988: 40) without giving much attention to this observation but it did not remain unnoticed (Tolman 1997, Tshikolovets 2011). For many years, the data for Greece were based only on this publication and its presence was never confirmed till the distribution map of *M. megala* (Pamperis 2009) added personal observations from different parts of Lésvos including also some blue dots. In the recent publication of Russell & Hall (2009) it is clearly stated that this species is found only in damp lowland localities and doubt is expressed on all other localities from where *M. megala* has been mentioned.

The criteria for its determination versus *M. telmessia*, the other *Maniola* species present in Lésvos, have been

clearly described (Russell & Hall 2009). These show that males (Fig. 13b) can be separated from *M. telmessia* based on the hindwing margin (pronounced scalloping for *M. megala* which is absent in *M. telmessia*) but this is not easy to use in the field. Wingspan of males is also a quite good indicator (Russell & Hall 2009) but should, in my opinion, never be used as a single criterion for the determination of butterflies. Unfortunately, the criterion of the hindwing margin is not at all valid for females and also the wingspan of both taxa have quite some overlap (Russell & Hall 2009). The upper- and underside of both *M. megala* (Fig. 13c–g) and *M. telmessia* females is very variable and makes the separation even more hazardous.

During my surveys in Lésvos and in all localities where *Maniola* specimens were flying, butterflies were collected for visual inspection. I was unable to confirm

the occurrence of *M. megala* at higher altitudes including the specific localities mentioned in the distribution map (Pamperis 2009) that were kindly provided by Pamperis. *M. megala* can be common (Fig. 13i), but very localized, and different populations in damp lowland habitats (Fig. 13a) have been found only in the Gulf of Kalloni separated by less than 4 km (MH, PR & MM). On 7.vi.2012, I observed a single courtship (Fig. 13h), but as the couple flew away over a massive *Rubus* bush, no actual copulation was observed.

MH informed me that one former habitat of *M. megala* is already completely ruined by building

activities. Other threats certainly include overgrazing. In one locality a sheep camp is nearby and a flock of sheep was seen grazing in the middle of the habitat. Further research on the biology and distribution of this taxon is needed. At present, there probably is not much more suitable habitat available and chances to find new populations in other parts of Lésvos seem very low. Protection and monitoring of grazing activities look mandatory to protect the remaining *M. megala* populations.

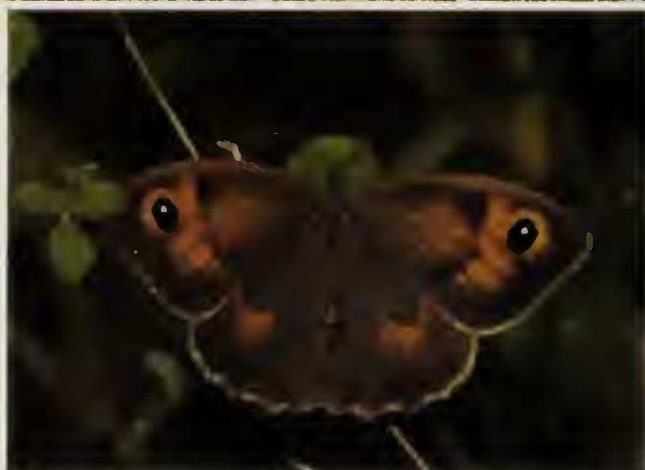


Fig. 13a – Habitat of *Maniala megala*, Lésvos, Gulf of Kalloni, 1.vi.2013 (Photo: SC).

Fig. 13b– *Maniala megala* ♂, Lésvos, Gulf of Kalloni, 5.vi.2012 (Photo: SC).

Fig. 13c – *Maniala megala* ♀, Lésvos, Gulf of Kalloni, 7.vi.2012 (Photo: SC).

Fig. 13d – *Maniala megala* ♀, Lésvos, Gulf of Kalloni, 9.vi.2012 (Photo: SC).

Fig. 13e – *Maniala megala* ♀, Lésvos, Gulf of Kalloni, 9.vi.2012 (Photo: SC).



Fig. 13f – *Maniola megala* ♂, Lésvos, Gulf of Kallóni, 7.vi.2012 (Photo: SC).

Fig. 13g – *Maniola megala* ♀, Lésvos, Gulf of Kallóni, 9.vi.2012 (Photo: SC).

Fig. 13h – Courtship of *Maniola megala* ♂ and ♀, Lésvos, Gulf of Kallóni, 7.vi.2012 (Photo: SC).

Fig. 13i – *Maniola megala* males gathering on *Rubus*, Lésvos, Gulf of Kallóni, 5.vi.2012 (Photo: SC).

Appendix

(see http://webh01.ua.ac.be/vve/Phegea/Appendices/Phegea_42-3_page_69.pdf).

1a Localities (maps) and observations of the author.

1b Updated overview of the butterfly distribution in the islands Híos, Psará and Lésvos.

Conclusions

Many new or unpublished data concerning butterflies have been provided for three North-Aegean Islands: Híos, Psará and Lésvos. The existing literature was critically analyzed and it looked mandatory not to include most of the data from the internet that were unreliable or impossible to check. For future research, we advocate to collect voucher specimens, especially for taxa that are unknown for an island, and to publish all observations in entomological journals. Among the most remarkable findings of this study are the extension of the distributional range of *P. thrax* to the North-Aegean islands Híos and Lésvos, adding six species new to Psará, two species new to Lésvos and one species new to Híos. The presence of *T. lineola* in Lésvos and *P. mannii* in Híos

is excluded based on lack of evidence. Notes on the genus *Maniola* provide more insight in their distribution and biology in the North-Aegean Islands and indicates that the taxonomy of this genus in these islands is not yet fully known. We encourage all entomologists to visit the Aegean islands for further research on the butterfly distribution. It certainly is possible to find new species for many islands that have been poorly surveyed and also in other periods of the year than formerly done.

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